CASE REPORT

Symptomatic Right-Sided Diaphragmatic Hernia in the Third Trimester of Pregnancy

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ABSTRACT

Background: Laparoscopic repair of incarcerated diaphragmatic hernias is widely recognized as both safe and effective. However, symptomatic diaphragmatic hernias encountered in the setting of pregnancy, while rare, present a significant surgical challenge. Furthermore, right-sided diaphragmatic hernias account for only 13% of cases. Here, we present a case in which a symptomatic, posterior right-sided diaphragmatic hernia, presenting in the later stages of pregnancy, was successfully repaired using a laparoscopic approach.

Methods: Our patient is a 42-y-old gravid woman who, at 27 wk gestation, was admitted to the gynecology service with a 2-d history of right upper quadrant abdominal pain, right shoulder pain, abdominal distension, and obstipation.

Results: Computed tomography of the chest demonstrated an incarcerated right diaphragmatic hernia. Surgical consultation was obtained, and the patient was taken to the operating room urgently for repair. Intraoperatively, the cecum was reduced and the diaphragm repaired primarily using a laparoscopic approach. The patient recovered well and was discharged home on postoperative day 8 with no complications to the patient or the pregnancy.

Conclusion: Laparoscopic reduction and repair of symptomatic incarcerated diaphragmatic hernia can be safely performed in the third trimester of pregnancy.

Key Words: Diaphragmatic hernia, Laparoscopy, Pregnancy.

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INTRODUCTION

We present the case of a 42-y-old woman who, in her 27th week of pregnancy, came to the Emergency Department at our facility with complaints of persistent right-sided chest pain for a period of 2 d. On presentation, she also described right shoulder pain and right upper quadrant abdominal pain and obstipation. She denied having passed flatus for 2 d. She was afebrile with normal vital signs and some abdominal distension noted on physical examination. Laboratory findings demonstrated a mild leukocytosis. Otherwise, her complete blood count and electrolytes were within normal limits. She was admitted to the obstetrics and gynecology service. Pulmonology was consulted and a computed tomography (CT) scan of the chest was obtained at their recommendation **(Figures 1, 2)**. This study demonstrated a right-sided diaphragmatic hernia. General surgery was then consulted, and the patient was taken to the operating room for repair the same morning.

In the operating room, the patient was placed in the supine position and general anesthesia was induced. An obstetrician was present for intermittent fetal monitoring. The abdomen was entered by way of an epigastric Hasson trocar placed under direct visualization. Insufflation was achieved and the laparoscope was introduced, revealing the abdominal contents. The patient was positioned in a steep reverse Trendelenburg and 4 additional 5-mm ports were then placed under direct visualization. The colon was seen emanating up into the right upper quadrant. It appeared significantly dilated secondary to what seemed to be a closed loop obstruction. It became obvious that this was the cecum, which was incarcerated within the diaphragmatic hernia. The liver was reflected inferiorly, revealing colonic incarceration within the defect. To reduce the hernia contents, it was necessary to extend the diaphragmatic defect slightly on the medial side. This was done using a Harmonic scalpel (Ethicon Endosurgery, Somerville, NJ, USA). Using gentle retraction over a period of about 15 min, the colon was reduced out of the chest. Several serosal tears were identified along the cecum and the right colon. These were all repaired with 3–0 silk

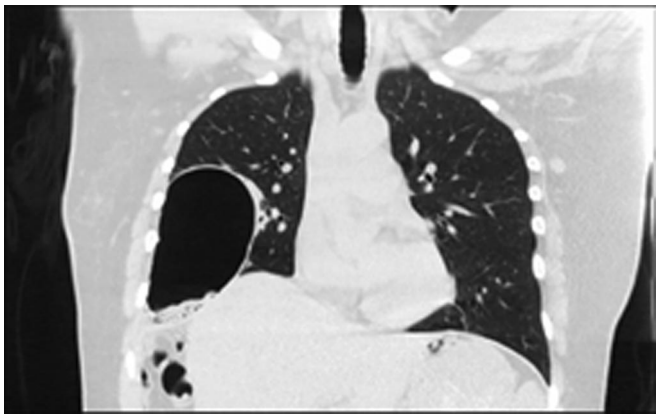

Figure 1. Computed tomographic scan showing a right-sided diaphragmatic hernia.

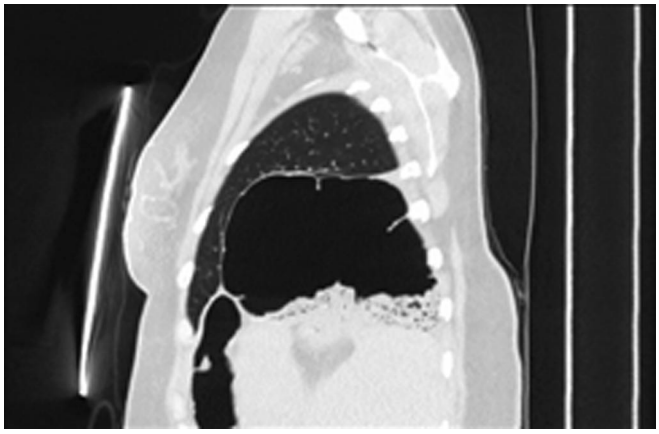

Figure 2. Computed tomographic scan showing a right-sided diaphragmatic hernia.

sutures. On careful inspection, there was no evidence of ischemia or other irregularity within the colon itself and no other injuries were identified. The diaphragmatic defect was posteromedially located and was complete, thereby allowing full communication with the chest. There was no hernia sac. The 7-cm defect was closed primarily with several interrupted 0 silk sutures placed in figure-of-eights. Evicel (Ethicon Biosurgery. Somerville, NJ, USA) fibrin sealant was then instilled over the repair and between the liver and the diaphragm. Blood loss was minimal. The patient recovered well, and the following day she was started on a diet. The remainder of her hospital course was uneventful, and she was discharged home on postoperative day number 8. On the day of discharge, she was tolerating a regular diet, had minimal narcotic requirements, and had suffered no complications to the pregnancy.

DISCUSSION

The literature describing diaphragmatic hernias in pregnancy, while not voluminous, is perhaps more robust than one might imagine. A recent review by Yue et al.[1] describes 23 cases over the last 50 y in English language publications. Among their figures, they show that right-sided diaphragmatic hernias constituted only 13% of the documented cases. They also show that laparoscopic repair represents only 1% of all repairs performed with the rest achieved through laparotomy, thoracotomy, or a combination of the 2. Despite their comprehensive nature, these numbers are not sufficient to provide even a single institution with a collective experience large enough to direct a specific course of surgical management.

Historically, symptomatic diaphragmatic hernias present a challenging surgical repair. In pregnancy, the repair is further complicated by the reduction of intraabdominal domain, decreased visualization, risk of premature labor, as well as the further risk of fetal compromise secondary to intrauterine injury and decreased uterine blood flow. Laparoscopy has long been established to be both safe and effective in pregnancy.[2] Laparoscopic repair of incarcerated diaphragmatic hernias has, likewise, been proven to provide safe and durable repair. In their series encompassing 12 y and 21 cases of adult laparoscopic diaphragmatic hernia repairs, Palanivelu et al.[3] describe only one repair in a pregnant patient. This case is further elucidated in a case report where they describe a left-sided hernia, which was reduced and repaired primarily with mesh reinforcement.[4] Similarly, the patient tolerated the procedure well and was discharged home without complication to the mother or fetus.

Contrasting Palanivelu's case with the one we describe here, they differ primarily in regards to the location (right vs. left) and the type of repair (primary repair alone vs. primary repair with mesh reinforcement). In our case, the diaphragm is naturally shielded by the liver on the right side and recurrent herniation of a viscous through that space would be unlikely. The need for prosthetic reinforcement, in our opinion, is not warranted and primary repair remains the most prudent option. The same cannot necessarily be said for a left-sided defect. In his series, Palanivelu concludes that, in general, laparoscopic diaphragmatic hernia repair is best accomplished with prosthetic reinforcement. Rosen et al.[5] recently described laparoscopic repair of a right-sided Bochdalek hernia in an adult male using mesh. However, successful primary laparoscopic repair has also been reported for similar hernias resulting from trauma.[6] In the pregnant patient, additional

mesh repair must be weighed against the extended operative time involved as well as the increased technical difficulty of placing the prosthetic in the presence of a gravid uterus.

Given these results, in conjunction with our findings presented here, it is reasonable to conclude that laparoscopic repair of symptomatic diaphragmatic hernias in pregnancy, either with or without mesh, can provide safe and successful repair. It is our hope that, as time goes on, these initial case reports will be incorporated into a larger body of literature, thus providing evidence to which future surgeons may refer in the event they encounter this rare, albeit manageable, surgical dilemma.

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